

# AMERICAN RAILROAD JOURNAL, AND ADVOCATE OF INTERNAL IMPROVEMENTS.

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PROPRIETORS.]

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## AMERICAN RAILROAD JOURNAL.

NEW-YORK, FEBRUARY 1, 1838.

### EVERY'S ROTARY ENGINE FOR SAW AND FLOURING MILLS.

In reply to the frequent letters received in relation to this Engine for driving mills, we give herewith an extract from a letter written by an experienced miller, who has applied the Rotary both to sawing and grinding—and who therefore speaks from *personal knowledge*, having no further interest in the subject than to have *ample and cheap* power to do his work.

The main shaft of the mill referred to, is over sixty feet in height, driving four run of stones, elevators, smut machine, bolts, and all the machinery necessary for a first-rate Flouring establishment. This letter was written when the mill had been in operation only a few weeks, before the machinery had become perfectly worn to its place.

The great advantages of this Engine are said to be its simplicity, *economy in first outlay*, in *fuel*, in *repairs*, and in *attendance*.

Extract from a letter written by a gentleman who has been long engaged in manufacturing Flour, dated—

Clyde, Wayne Co. N. Y. Nov. 17, 1837.

"Our Mill of four run of stones propelled by Avery's Rotary Engine" has, with great ease, made 100 bbls. flour, with 5 cords of wood, in twenty-four hours; and it has, without any extraordinary exertion, made 125 bbls. in twenty-four hours.

We do not hesitate to say that after all the difficulties, incident to the first start-

ing, and running a large and extensive Flouring Mill, in getting the Journals and Machinery worn smooth, and to fit their places so as to run regularly, that we can, with the same amount of fuel, and with greater ease, manufacture 150 bbls. flour in twenty-four hours, than do what we have above stated.

Mr. Cook, in his mill with 2 saws, can easily cut 8 thousand feet in twenty-four hours, which requires less than one cord of wood, in addition to the slabs it makes. I built the mill now owned by Mr. Cook, and know it can perform with great ease, all I have stated above.

We have full confidence in this kind of Engine, and know that it is altogether ahead of any thing of the kind now in use, in all respects. By giving it the necessary quantity of boiler, the Engine is competent and powerful enough to drive any description of machinery.

Very respectfully yours,

BENJAMIN FORD."

For the Railroad Journal.

A globe, five inches in diameter, presents about 253 inches surface. Now on each inch of the surface we will suppose there is an internal pressure of 1000lbs., and that the metal will bear no more. It will make no difference whether this pressure be produced by bars of steel or columns of steam, each inch has its 1000lbs. These bars must be so shaped and put together as to have a base to rest on, sufficient to sustain them. The shape then required for 253 bars to fill this globe, will be one inch square at the top, two and a half inches long, and reduced to a point at the other end.—The body of the globe thus filled cannot give in any direction, so that an additional force of 50lbs. to any one bar must punch it through. Now a globe 5 feet in diameter will receive 35,558 bars, each one inch square at the top, two feet and a half long, reduced to a point at the other end. Hence it will take an additional force over the 1000lbs. to make one of these bars punch a hole through the vessel. Therefore I reason, that the same strength of metal will sustain steam in a large boiler, as well as in a small one, if the shape be a globe. Now let us suppose this five feet globe cut in two, and a cylinder of the same

diameter put in between the parts, so as to form a boiler with circular heads.—To fill this cylindrical part, we must suppose these bars to be the same at the top, that is, one inch square, two and a half feet long, one inch broad at the point, reduced to the shape of a wedge, and the same principle must hold good.

In a discussion the other day with a friend of mine, who is engaged in making some important experiments, I laid it down as a principle, that the thickness of the shells of steam-boat boilers need not be increased in proportion to their size. He said: If I could establish that fact, it would be worth thousands to him. In your valuable paper, I have not seen any illustration of this subject. The general impression is against me, but we of the Far West have to blunder along until we gather knowledge from the scientific at the East, or by accident stumble on it.

Your Friend,

D. EMBREE.

Concluded from our last.

### BUFFALO AND ERIE RAIL ROAD REPORT.

T. S. Brown, Chief Engineer.

It is proposed that the Buffalo and Erie Railroad shall consist of two tracks, and with this in view, and to furnish sufficient room for the transaction of the very heavy business which must at a future day be done upon it, a strip of land will be obtained six rods wide.

In the first instance the grading will be done but for one track, except in those cases where a great saving may be effected by grading for both tracks at once, and at those points where two tracks will immediately be required to facilitate the business of the road. The width of track will be 4 feet  $8\frac{1}{2}$  inches; the width of road for two tracks will be 24 feet; the side slopes will be inclined at the rate of  $1\frac{1}{2}$  base, to 1 perpendicular; and the width of the side ditches in excavation will be 4 feet.

### III. Estimate of the cost of the Road.

Two distinct estimates will be presented; one for the completion of one track, and for putting the road in a condition to commence business; the other for the

completion of two tracks, with a full provision for all the accessories, necessary to the successful prosecution of Railroad business on a large scale.

1. Estimate of the cost of completing one track, and putting the road in a condition to commence business; the bridges, except the trestle bridges over ravines, &c., to be built for two tracks.

From DUNKIRK to BUFFALO: 42 miles.  
Embankment, 424,733.5 cub. y.  
Excavation, 283,168.3 "

Total, 707,901.8 " \$77,869 19  
Bridging and masonry, 49,310 00

In this item, the following amounts besides others, are included. For a trestle bridge, 2000 feet long, over the valley of Silver Creek, \$8000 00; for a bridge over Cattaraugus Creek, \$4,500 00; for a trestle bridge, 900 ft. long, over the valley of Mud Creek, \$2,700 00; for a bridge, 400 feet long, over Eighteen Mile Creek, \$16,000 00; and for a bridge over Buffalo Creek, \$2,500 00. Ample provision is made for drainage, but masonry will be used sparingly, owing to the scarcity of good stone.

Superstructure,  
For one mile,  
Timber,

Longitudinal pieces, delivered round, 10,560 running feet, 1½ cents per ft., the roadway through woods supplying a considerable proportion, \$184 80

528 cross ties, at 8 cents, 42 24  
5,280 feet round timber for props, at ¾ cent per ft. 39 60  
Wedges, 50 00

Sawed rail, five inches square, 22,000 feet board measure, at \$10 per m., 220 00  
Workmanship, 700 00

Iron,  
Plate rail, 2½ by ¾ inches, 26½ tons per mile, at \$75 per ton, 1,987 50  
705 end plates, at 7 cents each, 49 35

1,320 pounds 4½ inch pressed spikes, at 10 cents per pound, 132 00  
Workmanship, 50 00

Making horse path, finishing banks, clearing ditches, distributing materials, &c., 700 00  
Unforeseen expenses, 44 51

Total for one mile. \$4,200 00  
45 miles of superstructure, at \$4,200 per mile, 189,000 00  
Turn-outs, road crossings, &c. 600 00  
Land and fencing, 18,450 00

Chopping and grubbing, 2,000 00  
Engineering and miscellaneous expenditures, 30,000 00  
Depots at Buffalo and Dunkirk, 20,000 00  
Water stations, 6,000 00

Total cost averaging \$9,362 60 per mile. \$393,229 19

To commence business,  
4 Locomotive Engines, 30,000 00  
40 Passenger Cars, 32,060 00  
40 Burden Cars, 12,000 00

Total, \$467,229 19

From DUNKIRK to the STATE LINE;  
28 miles.

Embankment, 183,274.9 cubic y,  
Excavation, 112,512.0 " "

Total, 295,786.9 \$29,578 69  
Bridging and masonry, 23,640 00

In this item the following amounts are included, viz:—For a bridge over Canadaway Creek, \$1,590 for a trestle bridge, 600 ft. long, over Little Canadaway Creek, \$1,800; and for a bridge over Chautauque Creek, \$3,690.

Superstructure: 31 miles, at \$4,200, per mile, 130,200 00  
Turn-outs, road crossing, &c. 400 00  
Land and fencing, 14,000 00  
Chopping and grubbing, 1,400 00  
Engineering and miscellaneous expenditures, 20,000 00  
Depots and water stations, 13,500 00

Total cost, averaging \$8,311 38 per mile. \$232,718 69

To extend the business of the road from DUNKIRK to the STATE LINE.

2 Locomotive Engines, \$15,000 00  
20 Passenger Cars, 16,000 00  
20 Burden Cars, 6,000 00

Total, \$269,718 69

RECAPITULATION.  
Cost of road from Buffalo to Dunkirk, \$393,229 19

Cost of road from Dunkirk to State Line, 232,718 69

Total cost of 70 miles of road, averaging \$8,942 11 per mile, \$625,947 88

To commence business,  
6 Locomotive Engines, \$45,000 00  
60 Passenger Cars, 48,000 00  
60 Burden Cars, 18,000 00

Total expenditure for completing one track, with bridging for two tracks, and for providing ample means for the commencement of business, \$736,947 88

2. Complete estimate of the cost of constructing the road with a double track. This estimate includes the amount

of the previous one, and the difference between the two will be expended at a future period, when the business of the road shall require it.

From BUFFALO to the STATE LINE:  
70 miles.

Embankment, 900,990.7 cubic y.  
Excavation, 509,850.0 " "

Total, 1,410,840.7 \$151,028 16  
Bridging and masonry, 100,950 00

Superstructure, equal to 145 miles of single track, at \$4200 pr mile, 609,000 00

Turn outs, road crossings, &c., 2,000 00  
Land and fencing, 32,450 00

Chopping and Grubbing, 4,000 00  
Engineering and miscellaneous expenditures, 60,000 00

Depots and Machine shops, 45,000 00  
Water stations, 15,000 00

Total cost, averaging \$14,563.26 per mile, \$1,019,428 16

For a full business,  
12 Locomotive Engines, 90,000 00  
80 Passenger Cars, 64,000 00

150 Burden Cars, 45,000 00

Total, \$1,218,428 16

To inspire confidence in these estimates, it may be stated, that for the most of the items, the cost has been determined by taking the cost of similar items on works actually constructed, and adding a large per centage on account of the present advance of prices.

Should there be such a general decline of prices as there seems good reason to anticipate, there can be no doubt that the work ought to be constructed for less than the amount stated in the estimate.

It will have been observed that an estimate has been made of the cost of land, although it is expected that the liberal feeling which will undoubtedly actuate the land holders along the route, towards a work destined to be of immense value to the country through which it is to pass, will relieve the company from all expense for this object.

IV. *Estimate of the probable profit which the Road will yield to the Stockholders.*

Under this head so much must necessarily be left to conjecture, that nothing more than a reasonable approximation can be expected. Feeling sanguine, however, that the work will yield a large return upon the capital invested, I will present briefly, some of the data upon which my opinion is founded, and each stockholder will be enabled to determine for himself, the degree of weight to which the opinion is entitled.

Supposing the road with one track completed from Buffalo to the State line, and provided, according to the estimate above, with ample means for the commencement of operations; the cost of carrying on the business of transporting passengers, and of repairs, and mainte-



nance of way, may be estimated at about \$70,000 dollars a year. If we suppose the travel to be on an average only 75 passengers each way per day, the nett profits for a year would be \$94,000 dollars, or nearly 13 per cent. On the supposition that there would be 100 passengers each way per day, the profits would be upwards of 20 per cent, and should the number be as great as it is on the Utica and Schenectady Railroad, the annual profits would be between 30 and 40 per cent.

To any one familiar with the rapid increase of population and wealth in the west, it will appear far from extravagant, to expect that within ten years from this time, there will be as much business done on the Buffalo and Erie Railroad as is done at present on the Utica and Schenectady Railroad. The probability is that in much less than ten years, this expectation will be realized. The number of travellers by stage, last year, between Erie and Buffalo, was twice as great as it was the preceding year, and for some time to come the increase will probably go on at almost as great a ratio, as the facilities for travelling are multiplied. The present post road along the Lake shore, from Buffalo westward, is for the first 30 miles, notoriously among the worst in the State. There are few travellers in this region of country who do not dread passing the "Cattaraugus woods;" nevertheless the number of stage passengers upon this road, both ways, during the end ending April 1st, 1837, was about 11,000, besides great numbers by private conveyance, almost the whole of the travelling being done during the suspension of the Lake navigation. If a Railroad had existed, the increased amount of travel for the winter months alone, would unquestionably have doubled the whole amount for the year. In the present state of things, many who have occasion to pass in the winter from Buffalo to Michigan and to the countries west of it, choose the route through Canada, from the Niagara River to Detroit, notwithstanding all its inconveniences; but when your railroad and those which are to connect with it shall have been completed, nearly the whole of these travellers will prefer to go by the south shore of Lake Erie, through the flourishing country and populous towns of the United States. Great numbers who now travel between the east and the west, in the winter, by the way of Pittsburgh, and through other channels, will prefer the northern route, as soon as the line of communication of which your road forms a part, shall have been thrown open.

The whole number of persons arriving at and departing from Buffalo, by water, during the season of navigation, is probably much more than 200,000. It cannot be considered extravagant to expect, that at this number, at least one-fourth would prefer the railroad to the steamboat. Many having business along the Lake shore, would take the railroad as

being most convenient, many would take it on account of the greater rapidity with which they could travel, and very many would be induced to take it from a dread of sea sickness, and the dangers of Lake navigation. These and other considerations, would probably induce a much greater portion than I have stated, to prefer the land conveyance to that by water. If the railroad were at this moment in operation, the number of travellers on it could not be less than from 60 to 80 thousand in a year, which would produce a profit of from 12 to 20 per cent, but before the work can be constructed these numbers will be greatly increased. By the time your road is finished, those which are to connect with it both at its eastern and western extremities, will also be in operation, and the amount of travelling in the winter season will thereby be much augmented.

When the New-York and Erie Railroad shall have been constructed, your road will derive from it also a large accession of business; and that operations on that great work will speedily be resumed, no one aware of its vital importance to the City of New-York and to more than half the territory of the State, can for a moment doubt.

In addition to the revenue from passengers, there must likewise be very considerable receipts on account of freight. Of this no estimate will be attempted, but it may be suggested that the freighting business of Chautauque County alone, which already numbers about 50,000 souls and is rapidly increasing in population, would go a considerable way towards defraying the expenses of the road. In the spring and fall, just before the opening of the Lake navigation, and just after it has closed, the business on the railroad will be particularly active and there will always at those times be much freight to be conveyed.

The transportation of the United States Mail will afford another important source of revenue. The receipts on this account will probably be from \$10,000 to \$15,000 a year.

The general result of the whole of these imperfect views is, that the Stockholders are entitled to indulge, with confidence the most sanguine expectations of handsome profits from their investment.

Accompanying this Report, I lay before the Board of Directors thirteen maps drawn by Mr. R. S. Moore, which embrace plans and profiles of the whole of the routes surveyed.

I received my appointment last October, and on the first of November the preliminary surveys were continued in the field through the most severe part of the winter, until the end of January, during which time, careful instrumental examinations were made of upwards of 155 miles of line. I should do great injustice to all the gentlemen engaged with me, did I not bear testimony to the zeal and energy with which I was seconded

by them, in carrying into effect the wishes of the company. Very respectfully,

Your obedient servant,

T. S. BROWN.

Chief Engineer of the Buffalo and Erie Railroad.

Dunkirk, N. Y. May 1st. 1837.

#### DREYER'S PATENT RAIL.

The superiority of rail road transportation in regard to speed, cheapness, comfort and pleasure, before any other mode of conveyances, seems to be fully established; and the moving power by the application of steam and the invention of excellent locomotives within a very short time has been brought to such admirable perfection, that nothing else appears to be wanting, but to remove some defects, inconveniences and dangers, still arising from the construction of the rail road itself, and by lessening the cost of the building and repairing to give this branch of industry an internal improvement a greater extension and utility. However, amongst all the improvements already made and displaying so much ingenuity and talent, the construction of the road has been rather neglected and until this day we are exposed, not only to the disagreeable jarring and noise, but also to those dangers, which are inseparable from the present mode of fastening the rails, which does not and cannot give them the proper and so much desired smoothness and continuity. It has, therefore, for several years been my study, to remedy these evils and obtain such a desirable object by finding a new, simple and cheap mode of laying and securing the iron superstructure of the road; and having, in my humble opinion, at last perfected my ideas and constructed a new form of the rails, which by several bolts and plates of peculiar shape are to be fastened on the string-piece, I do not hesitate no longer, to request your attention to the following description of my invention, which has met with the approbation of several scientific gentlemen, eminent mechanics and rail road builders.

My rolled iron rails, whose strength is optional, but require in my opinion only a thickness of one inch, are inside dovetail grooved, and consequently present a perfectly smooth and even surface. To fasten them on the stringpiece, I use for every bar of fifteen feet length.

*First.* Four wrought iron bolts, which have a top, dovetailed one way and straight the other, with an eye in their round lower parts, to receive wrought iron wedge keys.

*Secondly.* Two cast iron dovetailed plates, to be screwed to the timber, one at the end of each bar, and one in its middle, whose dovetails fit to the dovetailed groove of the rail, and

*Thirdly.* Four cast iron small plates, having a round hole in the middle, one for each bolt, to be slipped over them up to the timber; the bolts to be turned to fit

the dovetail groove in the rail, and then secured by the wrought iron wedge key through the eye of the bolt and the two flanges on the plate; as the wedge key is forced in, it secures firmly the rail to the stringpiece.

To give a clearer and more satisfactory view of the whole, permit me briefly to explain the manner I intend to lay the superstructure, and then point out some of the advantages of my plan.

After the mudsills, sleepers and stringpiece of the road are laid and every thing is fully prepared for the rails, I commence, by first fitting the dovetailed cast iron plates, according to their thickness on the timber of the stringpiece in their proper places, at the junction of every two rails and where each rail will find its middle, and shall have then the bolt holes bored, four inches from the ends wherever the rails or bars meet and at half the space between the middle dovetailed plate and the said first bolt holes, being a distance of three feet, seven inches; whereupon the bolts can be driven into their holes, with their straight top sides in a line with the stringpiece. Hereafter the dovetail plates must be slipped into the dovetail groove of the rail and so placed, that they may be let down, where they have been previously fitted on the stringpiece and can now be screwed into its timber. When this is done, the bolts are so far turned (ninety degrees) that their dovetailed heads fit in the dovetailed groove of the rail, and finally the bolt plates are slipped on and the wedges placed in the eyes of the bolts through the grooves of their plates, by whose power when wedged up tight, the iron rail is pressed to the timber and kept in its due position.

I believe this will be sufficient to give a full idea of my plan, without any drawings or model, which however may be seen in the Patent Office at Washington, or here in New York in the offices of the Long Island Rail Road Company. I shall now state some of the advantages of this new mode of constructing and fastening the rails.

1. The continuity of the rails is maintained in all cases, whether the road should yield to the weight passing over it or not, as the dovetails of the end, and middleplates and of the wedged bolts must keep them down and together, so that there is no possibility of their rising.

2. The superstructure of the road has always a smooth and even surface with the greatest solidity, which in combination will prove the best remedy against that continual disagreeable jarring and noise, interrupting and destroying so often the pleasure of this otherwise comfortable and speedy mode of travelling, and reminding the passengers of the dangers connected with a badly constructed road.

3. The adoption of this invention will give not only the road itself, but also the locomotives and cars a longer durability, because

a. A smooth and uninterrupted surface of the rails and their being wedged down tightly on the timber, prevents the rain and snow from penetrating into the wood and the interior parts of the iron superstructure, whereto the spikes of the flat and edge rails expose them and bring on early rottenness of the timber and oxydation of the iron.

b. The rails cannot give away towards the sides, when the stringpiece is properly laid, and consequently the track must remain in its due position and the motion of the engine and cars become more regular.

c. The timber does not suffer and wear out by the driving in, (and when repairs are necessary,) pulling out of spikes, which frequently splits the wood, and by bending or cracking injures the rails.

d. The much easier and more regular motion on a smooth and solid surface which remains in its proper place, preserves, as there is less friction and shaking, the wheels, machinery and body of the locomotives and cars. And

e. There is less moving power required in proportion as there is less friction and a greater regularity of the road.

4. The rails can be laid from six to nine inches higher, than in the present mode of constructing and fastening the edge rails, which is of vast importance for the northern parts of the country, where early and much snow falls, and contributes to lessen the moving power for a certain weight.

5. This new mode saves considerable expenses in laying and repairing the superstructure, as

a. No spikes need to be driven in or drawn out, and very little earth is to be removed, when the rails must be taken up, so that one man can do more, than three at present are able to perform; and as

b. The timber will answer until it is entirely rotten, being always kept to the rail by the power of the wedge key. But principally is to be considered

6. The very great difference in the first costs, in consequence of a large reduction of the weight of the necessary iron, which the following comparative statement will show. One mile railway require on both sides of the track

3520 yards of rolled iron edge rails, weighing per yard $56\frac{1}{2}$ lbs. and per mile	198,880 lbs.
3520 yards dovetail grooved rolled iron rails, 1 inch thick and $2\frac{1}{4}$ inches wide, weighing per yard 24 lbs., and per mile	84,480 lbs.

which gives a difference of weight, of not less than 114,400 lbs.

3520 yards edge rail require

10,560 wrought iron spikes of 1 lb., per mile	10,560 lbs.
3520 yards dovetail grooved rail require	

2816 dovetailed wrought iron bolts of $\frac{3}{4}$ lb., per mile	2,112 lbs.
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2816 wrought iron wedge keys of 11 oz., per mile	1,584 lbs.
	—3,696 lbs.

giving a difference of weight of wrought iron of	6,864 lbs.
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3520 yards edge rail require 2,112 cast iron plates of $6\frac{1}{2}$ lbs., per mile	13,200 lbs.
3520 yards dovetail grooved rail require	

1408 dovetailed cast iron plates of 3 lbs. 11 oz., per mile	5,192 lbs.
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2816 cast iron wedge plates of 11 oz., per mile	1,936 lbs.
	—7,128 lbs.

making a difference in weight of cast iron of	6,072 lbs.
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However, if a rail, of  $1\frac{1}{2}$  inches thickness (weighing 36 lbs. per yard) should be preferred, the difference of the rails in the weight of rolled iron, would stand thus:—

3520 yards, or one mile edge rails	198,880 lbs.
3520 yards, or one mile dovetail grooved rails	126,720 lbs.

still leaving a difference of	72,160 lbs.
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the other differences remaining the same.

Before I conclude my circular, I wish to observe that the rolling of rails, in their dovetail grooved form, can be done in any of the British iron works; and that in regard of my Patent Right, which is secured by Letters Patent of the United States, every company or individual, who resolve to adopt and use my invention, will find me very reasonable in my charges, offering at the same time, to undertake in connexion with MR. JAMES I SHIPMAN, Civil Engineer, the building of rail roads or laying their superstructure, according to my new mode, to whom or myself letters, requesting further information, may be forwarded, through the New York Post Office.

Most respectfully yours,  
PETER HENRY DREYER.

For the United States Gazette.

Render unto Caesar the things which be Caesar's.

My attention was directed a few days back to the following communication in the Boston Atlas:

GREAT PERFORMANCE OF A LOCOMOTIVE.  
We learn from the Philadelphia Senti-



nel, that a few days since a locomotive engine, constructed by their enterprising fellow citizen, M. W. Baldwin, Esq. drew upon the Philadelphia and Columbia Railroad from Columbia to Philadelphia, a train of 35 merchandise cars, being, exclusive of the engine and its tender, the enormous weight of 163 tons, 13 cwt. 1 qr. 4 lbs., at the usual rate of speed.

This is nothing to what our Yankee locomotives can accomplish. On the 25th March last, the following load was drawn on the Boston and Lowell Railroad by the "Stonington" locomotive, built by the proprietors of the Locks and Canals at Lowell, for the Stonington Railroad.

49 cars, loaded with cotton,	
wool, groceries, coal, &c.	
weighing	333,428 lbs.
Weight of 45 cars, at 3,800	
lbs. each	171,000
Weight of 4 cars, at 5,000	
lbs. each	20,000
Weight of tender	14,400

538,828 lbs.

Or 269 tons.

Distance 10 miles. Time  $51\frac{1}{2}$  minutes, or about 12 miles an hour. Train 826 feet long.

The engine stopped and started the train on a rise of 10 feet to the mile.

Now without meaning any thing offensive to the writer of the above article, truth compels me to remark, that as in a lady's letter, the most important item of information lies in the postscript—for if the last quoted paragraph had been omitted, we simple minded Philadelphians must have acknowledged defeat and have yielded the palm to our Yankee brethren; un'e's perchance some of us had been down east and "had taken notes to print at home." But we are very fortunately spared this trouble by the aforesaid paragraph, which informs us that the engine started her train on a grade of 10 feet to the mile.

Mr. Baldwin's engine carried its train over a grade of 32 feet and rising to 50 feet to the mile, and around curves of 600 feet radius. After stating this fact it will only be necessary to refer the intelligent writer in the Atlas, to what I have no doubt he well understands, namely, the statical law of inclined planes and the dynamical expression for the modulus of friction of railroad trains, in order that he may perceive that Philadelphia need not tremble yet for the well merited fame of her mechanics and manufacturers.

From the known results of the best experiments we may assume that the friction or which is the same for our purpose the traction on dead levels is 1-224 of the load, or 10 lb. to the ton.

It is an acknowledged statical principle that the force impelling a body down an inclined plane bears the same proportion to the weight of the body as the height of the plane to its length.

A calculation founded upon these data will show that the Lowell engine must have exerted a force of traction equal to

3420 in drawing 240 tons on a grade of 10 feet to a mile, or 1 in 528, the friction being 10 lb. and gravity 4 1-4 lb. to each ton and  $14\frac{1}{4} \times 240 = 3420$ .

By a similar calculation it will be seen that the Philadelphia engine exerted a force equal to 5270 lb. in drawing 170 tons, which was the load, including the tender, on a grade of 50 feet to the mile, or 1 in 106.

The friction being as before 10 lb. and gravity 21 lb. to ton, and  $31 \times 170 = 5270$ .

So that supposing the Philadelphia and Columbia road is in as good order as the Boston and Lowell road, which I am informed is far from being the case, the latter being considered one of the most perfect in the country, and the former one of the most defective. Mr. Baldwin's engine appears to have performed fifty per cent. more work than her Yankee rival, as it will be seen that the power exerted on the Columbia road would have drawn 360 tons on the Boston and Lowell road.

It is but just to say that the load drawn on the Columbia road was not a mere experiment of 10 miles, but being a regular every day business; those machines have drawn much more when they have been put on trial. I must therefore whisper to my New England friends, try again.

C.

#### VIRGINIA IMPROVEMENTS.

We find the following extract from a report made to the Legislature of Virginia, by the Committee on Roads and Internal Navigation, in the Courier and Enquirer. It evinces a spirit which will render the "Old Dominion" again, at no distant day, as distinguished as in days past. Let her but improve her natural advantages—which are inferior to no state in the Union—and she will stand in the front rank of the Union.

Will New York, after her glorious commencement of a more glorious system of internal improvement, stand with folded arms and see other states going so far ahead of her? We shall see:—

Virginia.—The Committee on Roads and internal Navigation in the Virginia Legislature, have made a report, accompanied by a bill, proposing to make various improvements on account of the state; the cost of which is thus estimated:

Rail road from the Tennessee	
line to Evansham,	1,200,000
Parkersburgh and Staunton	
Road,	160,000
Staunton and James River	
Turnpike,	200,000
Valley Turnpike,	500,000
North Western Improvements,	250,000
Improvement of James River	
below Richmond,	100,000
	<b>\$2,410,000</b>

Add to this sum three-fifths	
of the sum necessary to	
extend the Rail Road to	
Danville, whole capital,	
\$3,500, 00,	1,500,000
Amount of state subscription	
to road from Evansham to	
James River,	1,200,000
	<b>2,700,000</b>

Aggregate amount to be raised by the state, **\$5,110,000**

The report concludes with the following resolutions:

1. *Resolved*, as the opinion of this Committee, That it is expedient to construct the works specified in the annexed report, upon the principles therein indicated.

2. *Resolved*, that it is expedient to authorise the Board of Public Works, by law, to borrow from time to time, such sums of money as may be necessary to complete those works which are recommended as proper to be undertaken on state account; and also the sum necessary to subscribe the state's proportion of the capital, of the Joint Stock Companies recommended, whenever the individual subscription shall have been made.

#### MEMORIAL TO CONGRESS FOR THE IMPROVEMENT OF THE ALLEGANY RIVER.

To the Honorable the Senate and House of Representatives of the United States, in Congress assembled:

The practicability of the improvement of the Allegany River, for Steam-Boat navigation between Pittsburgh, Pa., and Orlean, New-York, being fully established, the undersigned, your memorialists, would respectfully solicit from your Honorable Bodies, an immediate appropriation for that object. An enlightened observer need but examine the geographical position of the Allegany from its entrance into the State of New-York, to its confluence with the Ohio, and with a knowledge of the characteristics of the stream, the conviction must be irresistible, that the improvement of such an avenue for the purpose of commerce and communication, must be of great national importance. This becomes more clearly apparent when it is considered, that upon the completion of the Genesee Valley Canal, in the State of New-York, (a work now in progress,) which is to unite the Grand Erie Canal at Rochester, with the Allegany at Orlean, a chain of inland water communication is completed from New-York city to the valley of the Mississippi, which a glance at the map will show is more direct, and experience will prove is more safe, cheap and expeditious than any other which can be obtained between these important portions of the Union. From the surveys made of the Allegany at different periods, particularly by the one made during the past summer, under the direction of Major G. W. Hughes, U. S. Topographical Engineer, by authority of Congress, (to whose report your memorialists would refer,) its im-



provement for steam navigation is found can be effected at an expense extremely limited, compared with the general benefits it would confer.

That it is a stream susceptible of improvement at a moderate expense, will appear from a general description. After its entrance into the State of New-York, many tributaries contribute to swell the channel, until it becomes a smooth, deep, and capacious River, and for the entire distance between Orleans and Pittsburg, flows over a pebbled bottom, unobstructed by rocks or sand-bars, with a uniform descent, and without one perpendicular fall, and is in its natural state, susceptible of being navigated by steam and other boats, during the most of the fall and spring months. Its importance as a channel of trade is enhanced by the fact that it is closed but a short time in the winter, is generally open for the purposes of navigation during the first weeks in March, and while other important water communications which connect the eastern with the south-western border, and now chiefly used for the conveyance of merchandize, are closed by ice, the Allegany remains open, through which goods, &c. may be transported and delivered at the different markets upon the Ohio, and its tributaries, several weeks earlier in the season, than by any other route;—to which consideration, when the advantages of increased cheapness, security, and expedition are added, your memorialists feel warranted in the statement—that this improvement would be attended with important practical blessings, and by facilitating the commercial intercourse of remote parts of the Union, would greatly contribute to the general good of a large portion of your fellow-citizens.

Let us for a moment imagine, what in a very short period will be reality,—the Genessee Valley Canal and the New-York and Erie Railroad completed, and merchandize, &c. from the commercial emporiums of the east designed for the Mississippi Valley, to be transported through this channel, arrives at the Allegany. How vast a country accessible by navigable waters without another transshipment here opens to the view of the trader! To the highest point of Steam-Boat navigation on the Mississippi River, is nearly five thousand miles. If this be taken as one continued chain, and the mighty streams which diverge from it, and which penetrate each of the States in the Mississippi Valley, be regarded as branches, one uninterrepted course of steam navigation is exhibited, of not less than twelve thousand miles. When in addition, we look at the Canals and Railroads contemplated and in progress within the several States connecting with these waters and extending to the Atlantic Ocean, the Great Lakes, the Hudson and the Connecticut, and other navigable waters, we extend the sphere of Steam-Boat, Canal and Rail-

road communication to not less than eighteen thousand miles, embracing in their extent almost every State in our Great Confederacy. To this extensive inland channel of communication, the Allegany, as a connecting link, is of vast importance.

The improvement under consideration being so clearly of a national character, would contribute so largely to the general welfare of your fellow-citizens in facilitating trade between the States, in time of peace, and in time of war by affording government a highly important avenue for the transmission of troops and munitions of war, your memorialists confidently believe that few improvements of a similar nature to which your attention will be called, will have equal claims, and none superior—for a liberal appropriation from your Honorable Bodies. Not only would this improvement greatly subserve the purposes of commerce between different and distant parts of the Union, and all the advantages of increased wealth and enterprize to every branch of industry be experienced, but by it a community of interest, of feeling, and of friendship will be more directly cemented and perpetuated, and the citizens of twelve at least of the States and Territories brought as by enchantment, into one common neighborhood, and become directly partakers in the advantages it would confer. The improvement of the Allegany between Pittsburg, Pennsylvania, and Orleans, New-York, is respectfully submitted to your Honorable Bodies, and as so large a portion of the People of the United States, being within the range of its benefits, must feel a lively solicitude in this subject, it is confidently hoped that in view of its national bearings, the prayer of your memorialists will be granted, by an immediate appropriation sufficient to accomplish the work. And your memorialists will ever pray, &c.

From the Baltimore Gazette.

MR. EDITOR:—It is a matter of very great astonishment to me, that the public will continue to submit to the inconvenience of having hydrants subject to being closed up by the frost, when they could so easily remedy it, not by adopting the new fashioned kind lately imported from Philadelphia by the Water Company, and which they propose to put down at a cheap first cost, but which in the end will be found to be exceedingly dear, but by the adoption of the one upon the principle invented by our fellow citizen, Sater T. Walker, Esq. The writer of this is personally acquainted with the fact, that this invention has been tested during the last two winters in the yards of John Scott, Esq. Fielding Lucas, Esq. James L. Ridgely, Esq. Walter Ball, Esq. and Edward Cockey, Esq.; and in every instance it has been found to answer the end proposed by the invent-

or, viz. furnishing, during the most severe weather, a free and unobstructed supply of water. In addition to this great desideratum, such is the construction of the works that friction to as great an extent as is practicable has been avoided, so that their duration may be considered equal to about one hundred of those down on the Philadelphia plan. The Assignee of the patent will, I feel assured, if applied to, put them at a reasonable cost to any of our citizens.

#### THE RAISING OF THE WILLIAM.

Much interest has been excited by the various methods adopted for raising the two vessels, the Apollo steamer and the William of Sunderland, both sunk near this town. The first was to have been raised by means of air bags, and the latter by cylindrical air cones. Through Mr. Kemp, the inventor of the latter apparatus, a number of scientific gentlemen, who take a great interest in the success of this novel means of raising vessels of any magnitude, have inspected not only the working models, but the whole apparatus by which the William is to be brought up. The William was run down by one of the foreign steamers last winter—she was 400 tons burden, and not being considered worth raising, was abandoned by her owners, and became a ruinous impediment to the navigation. The Lord Mayor, as conservator of the Thames, put out notices for tenders for the removal of the wreck, and Mr. Kemp's plan was accepted, his offer being 500*l*. A large schooner was brought to the spot, containing 32 cylindrical vessels each six feet high, by four and a half diameter, lined through with zinc, and having only one head. Across the opening is a strong iron, which is firmly attached to the machine, with a hook in the centre. The first step resorted to was to ascertain the precise situation of the vessel. This was done by means of Dean's diving apparatus, which merely consists of a copper helmet, with a glass front, supplied with air from a pump in the vessel above. The divers then proceeded to pass entirely round the vessel from head to stern a chain cable of tremendous strength. To this at intervening distances of six feet is attached short bridle chains; and to the end of each of these is a rope with a buoy attached to it, which floats on the surface. When everything below is complete, this rope is passed through the eye at the open end of the cone. The cone is then cast overboard and immediately fills with water, and descends exactly to the bridle chain. The diver then goes down and secures the two together. As soon as a sufficient number are attached, a tube connected with the air pump is placed under the open end; and the air is then forced from the pump into the cone, and as soon as it leaves the tube, rises naturally inside the vessel and displaces the water by taking its place at the upper end. The cylinders are filled in this manner by degrees, taking the alterna-



sides of the head and stern first. Water being a non-elastic fluid, will naturally cause a body that may be sunk to rise to the surface as soon as it shall be made lighter by the elastic fluid confined in the cylinders. Therefore it is quite clear that any body must be raised if only sufficient air attached to it, and this was the case in the experiment tried on a small vessel loaded with iron we had the pleasure of witnessing, and which it was the opinion of every person present must raise the William, it were not for the numerous impediments and obstructions that have been thrown in the way. The vessel lying in mid-channel is being continually run over by other vessels; and several times the iron chain round the bottom of the wreck has been carried away by the anchors of colliers and others getting foul of it. The buoys attached to the bridle chains have been over and over again destroyed by the paddle-wheels of the steamers, whose masters really appear bent on doing the machinery as much injury as possible. Two of the large cylinders were last week carried completely away, and have not since been found. The Lord Mayor has sent down a lighter, which is moored, to warn vessels from the spot, and the city flag is hoisted on board Mr. Kemp's schooner; fires are also kept burning the whole of the night; even this is to no purpose, for on Sunday afternoon last, just as every thing was prepared for weighing, down came a collier, damaged the schooner to the amount of 200*l.*, and carried away a large number of tanks. It is evident, unless some better protection is afforded Mr. Kemp, he must abandon this ingenious plan, at considerable loss to himself, and the almost total destruction of his property. The working model exhibited is that of a vessel about three feet long, loaded with iron, which was raised to the top of the water in the tank with the greatest possible ease, as was also a large lump of iron, and every person present seemed perfectly satisfied that this plan must succeed in deep water, where every other method would fail.—*Gravesend Journal*.

#### THE NEW GOVERNMENT STEAMER "GORDON."

The new steamer "Gordon," now lying in Woolwich Basin, is the largest steamer in her Majesty's service; she is of 1150 tons, builders measurement—37 feet 6 inches beam; and her depth of hold 22 ft. 9 in. She has sponsons on each side, which make the deck 10 ft. more, say 47 ft. 6 in.; length between perpendiculars, 179 ft.; over all 210 ft. She will carry a tier of 36-pounders on her main deck, and two large 24-pounders. At each end on the upper deck there are swivel guns that will range 290° round the horizon. The vessel is constructed from the designs of Sir William Symonds, Surveyor of the Navy, and is, without exception, as regards her build and form, the finest steamer afloat.

She will carry twenty days coal—1000 troops; 136 crew; and stores and provisions for all, for six months. The engines, which are of 320 horse power, are now making by Messrs. Seaward & Co., with their patent slide valves, now coming into such general use on board of steam vessels. The cylinders are 64 inches in diameter; wheels 26 feet; boilers all of copper, and the coal-boxes in the engine room will contain 360 tons of coal. The boilers, cylinders, and all the vulnerable parts of the engine will be four feet under the water line, besides having on each side from end to end of the engine room, a depth of coals in the boxes 7 feet thick. The whole of the steam machinery, may be said to be invulnerable from shot.—*London Mechanics Magazine*.

#### MANUFACTURES OF LANCASHIRE.

Probably the largest entire room for manufacture in this county, and if so, in Europe, is that of Messrs T. & E. Grundy, at Heap-bridge, near Bury. It is appropriated to the manufacture of woollens, and is 85 yards in length by 75 in width, and 12 feet in height; is supported by 253 pillars, some of which also bear gearing; it has 65 large windows, and 253 skylights; 672 feet of steam piping run through it, and about 2,688 feet of shafting are at work. It contains, or will contain, eight carding engines, probably the largest in this county; eight gigantic slubbing frames; 40 mules; 200 looms, some for weaving trials, three in width; 450 gas jets; will be worked by one engine of comparatively small power, and is surmounted by a funnel of 69 yards and two feet.—*Bolton Free Press*.

#### TELESCOPES.

A correspondent of the *Hereford Journal*, in reference to the inconvenience experienced from the condensation of moisture which is apt to take place upon the object glasses of telescopes in the atmosphere of the evening, says that it may be obviated by the employment of a tube of pasteboard 12 or 18 inches in length, so constructed as to fit upon the object end of the instrument. The invention, he says, was that of the celebrated astronomer De la Hire.—*London Mechanic's Magazine*.

#### ARTIFICIAL RUBIES.

M. Gaudin has presented a report to the Institute of Paris, detailing his mode of proceeding in the preparation of fictitious rubies, which in every respect resemble those found in nature. He submits aluminium, with a small quantity of chromate of potash, previously calcined, to the influence of a powerful oxy-hydrogen blow-pipe, by the action of which the material is melted, and no cooling, the crystal presents all the characteristics of the ruby. The Academy appointed M. Becquerel to examine into the merit of the discovery, and his report being deem-

ed conclusive, presented their thanks to the author.—*Id.*

#### A GOOD HEARING FOR DR. REID.

Dr. Reid of Edinburgh, who gave evidence before the House of Commons' Committee on the best way of constructing a building for the purpose of hearing, with reference to the new House of Parliament, is now on an acoustic tour through Europe, in order to examine the principal buildings with reference to their capabilities in that point of view. He lately paid a visit to Berlin and Potsdam—to the latter, it appears, for the purpose of examining the acoustic properties of the barracks. Our readers may be surprised at his pushing the ardour of research so far, but their wonder will cease when they learn that Dr. Reid is an Acoustic Commissioner, and travels at the expense of Government.—*Id.*

#### FUR IN STEAM BOILERS.

Messrs Neron and Kurtz of Brussels have advertised an invention for dissolving the "fur" which collects in kettles and boilers, and is found so serious a nuisance in all operations conducted by steam. For this they require a yearly subscription from those who avail themselves of it, of so high an amount as, in the case of steam engines, eight francs per annum for every horse-power. The German papers in taking notice of this, remark, that Mr. Bornschein of Frankfort on the Maine, announced a somewhat similar discovery in the early part of this year, but that by his plan, the "fur" is not dissolved when accumulated, but absolutely prevented from accumulating. For the disclosure of his method he only requires the sum of ten ducats, not yearly, but once for all. We should think that when this information reaches Brussels, Messrs. Neron and Kurtz will have few customers for their expensive wares, unless Bornschein's discovery be discovered to be useless.—*London Mechanics Mag.*

#### SILK WORMS.

The cultivation of the mulberry-tree, and the raising of silk-worms, has been adopted in Switzerland with great success. At Basle August, in particular, this new source of wealth has been astonishingly productive.—*Mining Jour.*

Volume Six will be completed as speedily as possible. The next, or Volume for 1838, will be published in a more convenient form for preservation.

Subscribers who desire to be supplied with missing numbers, will do well to apply for them soon. We shall always take pleasure in furnishing them if we have them to spare.

Particular attention will be given to the procuring of all kinds of Instruments required by Engineers.—Orders must be accompanied with the necessary funds or city acceptances.



## AGENCY.

The Subscriber offers his services as Agent, to procure Machinery for Mills, Steam Engines, Locomotives, Printing Machines, Presses, Types and Fixtures.

He will give prompt attention to all orders entrusted to him for execution; and pledges himself to those who may employ him, that no effort on his part shall be wanting to procure the best articles to be had in the city—and to give satisfaction.

He will also employ Millwrights and Engineers, to erect Mills, and put the Engines and Machinery in operation.

Orders accompanied with the necessary funds, or satisfactory city acceptances, should be addressed to D. K. MINOR, 30 Wall-st.

## LOUISVILLE, CINCINNATI, AND CHARLESTON RAILROAD.

**NOTICE TO CONTRACTORS.**—Sealed Proposals will be received at the Office of the Company in Columbia, S. C., until the 15th day of February next, for the graduation and masonry of that portion of the Road from Columbia to the crossing of the Congaree River, in the vicinity of McCord's Ferry, being 25 miles in extent.

Also, for the construction of a Bridge of 400 feet in length, on the Congaree River, to be built on stone piers and abutments, for which there are suitable quarries in the neighborhood.

The plans and profiles of the line will be ready for inspection at the Office of the Resident Engineer, in Columbia, S. C., after the 10th day of February.

So soon as the surveys for location, now in progress, are completed, that part of the Road extending from McCord's Ferry to the Charleston and Hamburg Railroad, at Branchville, will be put under contract, of which due notice will be given.

WM. GIBBS Mc NEILL,  
Chief Engineer.

The Railroad Journal, N. Y. Courier & Enquirer, N. York; Providence Journal, Providence, R. I.; Atlas, Boston; Philadelphia Enquirer, Philadelphia; will publish the above notice 6 times, and a copy of the paper to the Office in Charleston, S. C., and a certified copy of their account for payment.

Jan. 12 1836 fmw6

## NEW ARRANGEMENT.

## ROPES FOR INCLINED PLANES OF RAILROADS.

WE the subscribers have formed a co partnership under the style and firm of Folger & Coleman, for the manufacturing and selling of Ropes for inclined planes of railroads, and for other uses, offer to supply ropes for inclined planes, of any length required without notice, at short notice, the manufacturing of cordage, heretofore carried on by S. S. Durfee & Co., will be done by the new firm, the same superintendent and machinery are employed by the new firm that were employed by S. S. Durfee & Co. All orders will be properly attended to, and ropes will be shipped to any port in the United States.

12th month, 12th, 1836. Hudson, Columbia County, State of New-York.

ROBT. C. FOLGER.  
GEORGE COLEMAN.

## AMES' CELEBRATED SHOVELS, SPADES, &amp;c.

300 dozens Ames' superior back-strap shovels.  
150 do. do. do. plain do.  
150 do. do. do. cast steel Shovels & Spades  
150 do. do. Gold-mining Shovels  
50 do. do. plated Spades.  
50 do. do. do. Ket Shovels and Spades  
Together with Pick Axes, Churn Drills, and Crow Bars (steel pointed), manufactured from Salisbury refined iron—for sale by the manufacturing agents,

WITHERELL, AMES & CO.  
No. 2 Liberty street, New-York.  
BACKUS, AMES & CO.

For State street, Albany.

N. B.—Also furnished to order, Shapes of every description, made from Salisbury refined Iron. v4-1

## MACHINE WORKS OF ROGERS,

KETCHUM AND GROSVENOR, Paterson, New Jersey. The undersigned receive orders for the following articles, manufactured by them, of the most superior description in every particular. Their works being extensive, and the number of hands employed being large, they are enabled to execute both large and small orders with promptness and dispatch.

## RAILROAD WORK.

Locomotive Steam-Engines and Tenders; Driving and other Locomotive Wheels, Axles Springs and Flange Tires; Car Wheels of cast iron, from a variety of patterns, and Chills; Car Wheels of cast iron with wrought Tires; Axles of best American refined iron; Springs; Boxes and Bolts for Cars.

COTTON, WOOL, & FLAX MACHINERY, Of all descriptions and of the most improved patterns. Style, and Workmanship.

Mill Gearing and Millwright work generally; Hydraulic and other Presses; Press Screws; Callenders; Lathes and Tools of all kinds; Iron and Brass Castings of all descriptions.

ROGERS, KETCHUM & GROSVENOR,  
Paterson, N. J. or 60 Wall-st. New-York  
511f

## FRAME BRIDGES.

**THE** undersigned, General Agent of Col. S. H. LONG, to build Bridges, or vend the right to others to build on his Patent Plan, would respectfully inform Railroad and Bridge Corporations, that he is prepared to make contracts to build, and furnish all materials for superstructures of the kind, in any part of the United States, (Maryland excepted.)

Bridges on the above plan are to be seen at the following localities, viz. On the main road leading from Baltimore to Washington; two miles from the former place. Across the Molawamkeag river on the Military road in Maine. On the national road in Illinois at sundry points. On the Baltimore and Susquehanna Railroad at three points. On the Hudson and Paterson Railroad in two places. On the Boston and Worcester Railroad, at several points. On the Boston and Providence Railroad, at sundry points. Across the Contoocook river at Henniker, N. H. Across the Souhegan river, at Milford, N. H. Across the Connecticut river, at Hancock, N. H. Across the Androscoggin river, at Turner Centre, Maine. Across the Kennebec river, at Waterville, Maine. Across the Genesee river, at Squakiehill, Mount Morris, N. Y. Across the White River, at Hartford, Vt. Across the Connecticut River at Lebanon, N. H. Across the mouth of the Broken Straw Creek, Penn. Across the mouth of the Cataragus Creek, N. Y. A Railroad Bridge diagonally across the Erie Canal, in the City of Rochester, N. Y. A Railroad Bridge at Upper Still Water, Orono, Maine. This Bridge is 500 feet in length; one of the spans is over 200 feet. It is probably the firmest wooden bridge ever built in America.

Notwithstanding his present engagements to build between twenty and thirty Railroad Bridges, and several common bridges, several of which are now in progress of construction, the subscriber will promptly attend to business of the kind to much greater extent and on liberal terms.

MUSES LONG,  
Rochester, Jan. 19th, 1837. 4-y

STEPHENSON,  
Builder of a superior style of Passenger Cars for Railroads,

No. 264 Elizabeth street, near Bleeker street,  
NEW-YORK.

RAILROAD COMPANIES would do well to examine these Cars; a specimen of which may be seen on the New-York and Harlem Railroad, now in operation.

## ROACH &amp; WARNER,

Manufacturers of OPTICAL, MATHEMATICAL AND PHILOSOPHICAL INSTRUMENTS, 293 Broadway, New-York, will keep constantly on hand a large and general assortment of Instruments in their line.

Wholesale Dealers and Country Merchants supplied with SURVEYING COMPASSES, BAROMETERS, THERMOMETERS, &c. &c. of their own manufacture, warranted accurate, and at lower prices than can be had at any other establishment.

Instruments made to order and repaired.

1y-14

## RAILWAY IRON, LOCOMOTIVES, &amp;c. &amp;c.

THE subscribers offer the following articles for sale:—

Railway Iron, flat bars, with countersink holes and mitred joints,  
350 tons 2 by 1, 15 ft in length, weighing 4 1/2 lbs per ft  
280 " 2 " 1, " " " 3 1/2 " "  
70 " 1 1/2 " 1, " " " 2 1/2 " "  
80 " 1 1/2 " 1, " " " 1 1/2 " "  
90 " 1 " 1/2 " " " 1 " "

with Spikes and Splicing Plates adapted thereto. To be sold free of duty to State governments, or incorporated companies.

Orders for Pennsylvania Boiler Iron executed.

Rail Road Car and Locomotive Engine Tires, wrought and turned or unturned, ready to be fitted on the wheels, viz. 30, 33, 36, 42, 44, 54, and 60 inches diameter.

E. V. Patent Chain Cable Bolts for Railway Car axles, in lengths of 12 feet 6 inches, to 13 feet 2 1/2, 3, 3 1/2, 3 3/4, 4, 4 1/2, and 5 1/2 inches diameter.

Chains for Inclined Planes, short and stay links, manufactured from the E. V. Cable Bolts, and proved at the greatest strain.

India Rubber Rope for Inclined Planes, made from New Zealand Wax.

Also, Patent Hemp Cordage for Inclined Planes, and Canal Towing Lines.

Patent Felt for placing between the iron chair and stone block of Edge Railways.

Every description of Railway Iron, as well as Locomotive Engines, imported at the shortest notice, by the agency of one of our partners, who resides in England for this purpose.

A highly respectable American Engineer resides in England for the purpose of inspecting all Locomotives, Machinery, Railway Iron, &c. ordered through us.

A. & G. RALSTEN & CO.,  
Philadelphia, No. 4 South Front-st.  
28 tf

## ARCHIMEDES WORKS.

(100 North Moore-street, N. Y.)

THE undersigned beg leave to inform the proprietors of Rail Roads, that they are prepared to furnish all kinds of Machinery for Rail Roads, Locomotive Engines of any size, Car Wheels, such as are now in successful operation on the Camden and Amboy Rail Road, none of which have failed.—Castings of all kinds, Wheels, Axles and Boxes, furnished at the shortest notice.

H. R. DUNHAM & CO.  
NEW YORK, February 12th, 1836. 4-yt

## PATENT RAILROAD, SHIP AND BOAT SPIKES.

The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years' successful operation, and now almost universal use in the United States, (as well as England, where the subscriber obtained a patent) are found superior to any yet ever offered in market.

Railroad companies may be supplied with Spikes having countersink heads suitable to the holes in iron rails, to any amount and on short notice. Almost all the Railroads now in progress in the United States are fastened with Spikes made at the above-named factory—for which purpose they are found invaluable, as their adhesion is more than double any common Spikes made by the hammer.

All orders directed to the Agent, Troy, N. Y. will be punctually attended to.

HENRY BURDEN, Agent.  
Troy, N. Y., July, 1831.

Spikes are kept for sale, at factory prices, by I & J. Townsend, Albany, and the principal iron Merchants in Albany and Troy; J. I. Brower, 22 Water-street, New-York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrand & Smith, Boston.

P. S.—Railroad companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufacturing so as to keep pace with the daily increasing demand for his Spikes.

1123am H. BURDEN.

G. Mitchell, Printer, 263 Bowery, N. Y.



